Ethnic Differences in the Recurrence of Adenomatous Polyps after Colonoscopic Polypectomy

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A retrospective study was done of polyp recurrence rates following an initial clearing colonoscopy for adenomatous polyps. The intent of the study was to identify risk factors that would predict a greater risk for recurrence in Hawaii's ethnically diverse population. When the initial exam detected multiple polyps, a higher recurrence rate was found in Caucasian patients.

Introduction

Following an initial colonoscopy and removal of all identified polyps, the recurrence rate of adenomatous polyps has been reported to be 50%. Risk factors for recurrence include atypia and multiple polyps at the time of the index exam.[1,2,3] Because there are no data pertaining to the effects of ethnicity and risk of polyp recurrence, the ethnic diversity of the Hawaii population creates an ideal place to study this relationship. Of particular interest were the differences between Hawaii Japanese and Hawaii Caucasians; previous studies had suggested that residents of Hawaii who are Japanese have higher rates of colon cancer than do Caucasians.[4,5] The purpose of this study was to investigate the relationship between ethnicity, other patient demographics, index polyp features, and the recurrence of adenomas at the time of a follow-up colonoscopy.

Materials and Methods

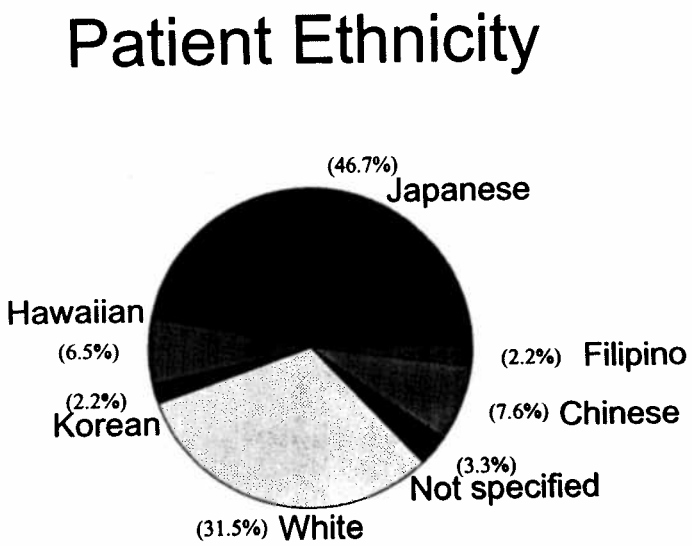
The Straub Clinic is a 150–physician multispecialty group located in Honolulu, Hawaii. Patients at Straub Clinic are encouraged by their primary physician to undergo screening with a flexible sigmoidoscopy as recommended by the American Cancer Society for colon cancer prevention.

The examination is performed by a nurse in Straub's Ano-Rectal Clinic, and in all cases, when a polyp is identified with flexible sigmoidoscopy, the patient is advised of the results of the screening and then referred directly to the gastroenterology department for colonoscopy or to the primary physician, who then is advised to refer the patient to gastroenterology. Colonoscopies and polypectomies are performed by board–certified gastroenterologists.

For morning procedures, patients are prepped with a commercial polyethylene glycol lavage solution administered the night before or the morning of the exam for afternoon procedures. Intravenous sedation with meperidine and midazolam or diazepam is administered during procedures.

The examinations are conducted with an Olympus fiberoptic or video colonoscope. Polypectomy is performed using the electrocautery snare whenever possible; polyps less than 5 mm and not snared were either cold-biopsied followed by monopolar fulgaration of the polyp base, or removed with hot biopsy forceps. Occasionally cold biopsy without subsequent cautery was used. Data from the flexible sigmoidoscopies and colonoscopies are kept on a computerized data base.

The names of 342 patients identified with at least one polyp by flexible sigmoidoscopy screening at Straub's Ano-Rectal Clinic from 1987 to 1990 were taken from the computerized log.



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This study was supported by a grant from the Straub Pacific Health Foundation, Honolulu.

Submitted for publication: May 12, 1993

Demographic, colonoscopic and histologic information was abstracted to a data collection sheet from the patient's chart and the computerized data base. If the patient had a follow-up colonoscopy to the cecum less than 2 years after the index examination, further data were abstracted to a second data sheet. Of the 342 patients identified with polyps at screening, 93 patients did not choose to proceed with a colonoscopy examination. Of the 249 patients who had a full colonoscopy, 48 patients did not have an adenoma at the index. Of the 201 patients who have at least one adenoma or carcinoma at the index, 84 patients did not return for a follow-up, 21 had a follow-up colonoscopy not to the cecum, 4 had a follow-up 2 or more years after their index exam; the remaining 92 qualified for this study. The mean interval between the first and second colonoscopies was 13 months.

The following statistics were employed to assess the significance of factors associated with finding at least one adenoma at the follow-up colonoscopy: Student's t-test (for continuous variables), Pearson's chi-square (for discrete variables), Fisher's exact test (when cells contained fewer than 5 observations), and Mantel-Haenszel chi-square. Chi-square was calculated using Yates' continuity correction for 2x2 contingency tables. Relative risk and 95% Taylor-confidence limits on the relative risk were calculated to determine the effect of index atypia on subsequent development of recurrent adenoma. Odds ratios and 95% confidence intervals on the odds ratio using the approximation method of Cornfield were calculated in addition to the Mantel-Haenszel chi-square to measure the effect of ethnicity on the development of adenoma at follow-up while controlling for the number of index adenomas.

Results

Eight patients (3 Japanese, 3 Hawaiian, 1 Filipino, and 1 Caucasian) were found to have a carcinoma at the time of the index examination. The numbers were too small to detect an effect of ethnicity on the prevalence of colon carcinoma. There

Table 1 Clinical Features and Recurrence of Adenomatous Polyps

	No Rucurrence N=51	Recurrence N=41	p value
Mean age (S.D.; range)	63 (s.d. 39-82)	66 (s.d. 43-86)	0.16
Sex ratio	33:18 (M:F)	30:11 (M:F)	0.52
Patients with largest adenoma >1cm at index exam	25/51 (49%)	21/41 (51%)	1
Family history of colon carcinoma	6/51 (12%)	5/41 (12%)	1
Atypia at index exam	16/51 (31%)	11/41 (27%)	0.81
More than one polyp at index exam	21/51 (41%)	33/41 (80%)	0.0002

Table 2 Ethnicity and the Risk of Recurrence of Adenomatous Polyps

Ethnicity		No Recurrence	Recurrence
Japanese	(N=43)	27 (64%)	16 (36%)
Caucasian	(N=29)	12 (41%)	17 (59%)
Chinese	(N= 7)	5 (71%)	2 (29%)
Hawaiian	(N= 6)	3 (50%)	3 (50%)
Korean	(N= 2)	1 (50%)	1 (50%)
Unspecified	(N= 3)	2 (67%)	1 (33%)
Total		51	41

p=.180

Table 3 Findings at Index Colonoscopy in Japanese and Caucasian Patients

	Japanese N=43	Caucasian N=27
Percent of population who are male*	65%	66%
Mean age*	64 years	65 years
Percent of polyps with atypia*	30%	27%
Percent of polyps proximal to the splenic flexure*	38%	25%
Mean number of adenomas*	2.56	2.35

*p>.05

Table 4 Risk of Recurrent Adenomatous Polyps Japanese versus Caucasian

	Japanese N=43		Caucasian N=27	
Number of adenomas at index	recurrence	no recurrence	recurrence	no recurrence
One	0	14	7	8
More than one	16	13	10	4

Mantel-Haenszel Chi-square=5.289 df=1
Two-tailed p=.021
Odds ratio=4.684 Cornfield's 95% confidence limits: 1.228 and 19.344

were 2 cases of Duke's stage A, 2 cases of Duke's stage B carcinoma and 4 cases of carcinoma in situ; these patients were included in the study. The ethnic distribution of the study population is shown in Figure 1.

The recurrence rate for adenomatous polyps found at a one-year follow-up colonoscopy in the entire population was 44.6%. Polyps found at follow-up were smaller: 77.3% of polyps found with follow-up were less than or equal to 0.5 cm compared to 56% at the index exam ($p = .0018$).

When the whole group was studied, age, sex, size of the polyp at the index exam, family history of colon cancer, and ethnicity did not identify patients at increased risk for adenoma during follow-up (Tables 1 and 2). A relationship was not detected between the location of the polyps upon index exam and the location of those found at follow-up.

In contrast, a strong relationship was noted between the number of adenomas found during the index exam and detection of an adenoma during follow-up. Of the patients who initially had only one adenoma, 21.1% had an adenoma when followed up; 61.1% of those with more than one polyp initally had an adenoma at follow-up (Table 1, $p = .0002$).

A relationship existed between the presence of polyps with atypia at the index and the presence of atypia at follow-up. Of the 65 patients with no atypia at the index, 3.1% had atypical polyps at the follow-up. Of the 27 patients with one or more polyps with atypia at the index, 22.7% had polyps with atypia at the follow-up (Relative risk 7.2, 95% confidence intervals 1.1 to 32.0, Fisher's exact test, $p = 0.021$).

Japanese and Caucasian patients, the two largest ethnic groups, were then studied separately. There were no differences in the incidence of atypia, location of polyps, age, sex ratio, or number of polyps during the index exam in these 2 groups (Table 3). Although there was a trend toward more right-sided polyps in Japanese patients, the trend was not significant.

Surprisingly, there was a difference in the risk of recurrence in the 2 groups. The risk of a recurrent adenoma was 4.684 times greater in the Caucasian group than in the Japanese after controlling for the number of polyps at the index exam (Table 4).

Discussion

Because two-thirds of the initial population were excluded for reasons detailed in the paper and the numbers were relatively small, this study was limited; however, in many respects the findings were consistent with those of others. The recurrence rate of polyps at one year follow-up was 44.6%, close to the 50% rate reported in the literature. It also was noted that multiple polyps at the index exam were associated with a higher-than-expected recurrence rate. In contrast, the relationship between ethnicity and the polyp recurrence rate has not been documented previously.

Polyps found at one year follow-up could have been missed at the first exam as opposed to newly developed polyps. Two previous studies reported approximately 15% of polyps were missed by colonoscopy.[6,7] Thus the recurrence rate at one year represents a mixture of new polyps and missed polyps. Japanese and Caucasian patients had similar numbers of polyps at the index exam, but fewer Japanese patients had polyps at the time of the follow-up examination. This suggests that either the miss rate during the first colonoscopy was lower or the regrowth rate of adenomas was lower in the Japanese population. A lower miss rate might be explained by differences in the quality of the preparation of the colon on the first exam between the 2 populations; however, because equal numbers of polyps in Caucasian and Japanese patients were found on the initial exam, a higher find rate in Japanese patients would mean they had fewer polyps than Caucasian patients to begin with. This seems unlikely given autopsy data from Hawaii showing that the frequency of adenomatous polyps in Hawaii Japanese is equal to or greater than that of Caucasians.[8] If the lower incidence of polyps at follow-up represents a lower regrowth rate in Japanese patients, the findings might be explained if our Japanese patients modified their life-style to a greater degree than did Caucasian patients after becoming aware they harbored adenomatous polyps.

Calcium, nonsteroidal anti-inflammatory drugs, dietary fiber and other environmental agents could have an effect on the risk of developing adenomatous polyps. Although Straub does not have a formal program to discuss diet alteration for patients with newly found adenomas, gastroenterologists frequently mention the possibility that a high-fiber diet could decrease the risk of colon cancer. Perhaps dietary fiber or exposure to other environmental agents was different in the Japanese patients compared to Caucasian patients in the year between the first and second colonoscopy. Unfortunately the retrospective nature of this study does not allow for this issue to be addressed.

The finding that Hawaii Japanese could be at lower risk for recurrent polyps is particularly interesting in light of previous reports that Hawaii Japanese paradoxically have more right-sided polyps than Caucasians but more left-sided colon carcinoma.[5,8] The findings of this study add weight to the idea that there are ethnic differences in the development of adenomas and colorectal carcinoma, and that the biological trigger for adenoma growth could be different from that which takes an adenoma to carcinoma.

Conclusions

This study suggests that ethnic differences exist in the regrowth of adenomatous polyps after an initial colonoscopy and clearing polypectomy, specifically Japanese patients are less likely than Caucasian patients to have polyps present at the time of a one-year follow-up colonoscopy. In Hawaii's population, it appears that Japanese patients with a single adenomatous polyp without atypia are at particular low risk for recurrence one year following a clearing colonoscopy.

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gous donation can have very important benefits in the appropriate patient population, since exposure to homologous blood usually can be reduced or eliminated. A second effect, possibly advantageous and deserving more study, is a higher hematocrit during surgery and hospitalization, due partly to the erythropoietic stimulus of phlebotomy and partly to the greater likelihood that red cells will be given if autologous units are available."[11]

Benefits of autologous transfusion for the donor-patient are numerous, and a physician should explain clearly to the patient that this procedure:

- Eliminates transmission of infectious disease
- Eliminates risk of alloimmunization to erythrocyte, leukocyte, platelet or protein antigens
- Eliminates risk of hemolytic, febrile or allergic reactions due to alloantibodies
- Eliminates risk of graft-versus-host reactions
- Stimulates erythropoiesis by repeated preoperative phlebotomy
- Reduces the quantity of homologous blood used in a given procedure.

Risks of autologous donation

The drawbacks to autologous donation are limited and for the most part of minor significance:

- Potential exists for presurgical anemia or hypovolemia[12]
- Potential exists for human error and mix-up of blood units prior to transfusion.

Additionally, according to Thurer and Kruskall, "Collecting and transfusing autologous blood is unnecessary and inappropriate for those surgical procedures that seldom require transfusion. Medical facilities and fiscal resources are strained when patients donate autologous blood that will not be used."[13]

"The most important option [for the physician] is to do everything possible to make transfusion unnecessary, to eliminate the transfusion experience...The first question to be considered for any patient is, 'Is the transfusion necessary?'"[11]

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